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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/758,676

01/15/2004

Kenny Randolph Parker

80002/US02

6075

68937

7590

08/11/2008

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EXAMINER

OH, TAYLOR V

ART UNIT

PAPER NUMBER

1625

MAIL DATE

DELIVERY MODE

08/11/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/758,676	<b>Applicant(s)</b> PARKER ET AL.	
	<b>Examiner</b> Taylor Victor Oh	<b>Art Unit</b> 1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/06/08</u> .   | 6) <input type="checkbox"/> Other: _____                          |

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/26/08 has been entered.

#### The Status of Claims

Claims 1-22 are pending.

Claims 1-22 are rejected.

#### ***Claim Rejections - 35 USC § 102***

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 8-10, 13-15, and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Lee et al (US 6,013,835).

Lee et al teaches a process of producing terephthalic acid in the followings (see col. 14, lines 11-35):

The present inventions will be described in terms of the production and recovery of terephthalic acid (TA) from the air oxidation of p-xylene in the presence of a solution of components of catalysis in dimethyl terephthalate (DMT) or in a benzoic acid-water solvent system. The oxidizer temperature is preferably between about from 150° C. and about 250° C. and the pressure is from between about 5 and about 30 kg per cm<sup>2</sup>. Since the oxidizer effluent will contain up to 30% TA, mixing in the oxidizer is very important in order to maintain the yield and selectivity, and to prevent fouling and blockages. The initial mixing of the feed streams may be achieved in a static mixer (outside of the oxidizer). Further mixing may be provided by air sparging and external circulation. In the preferred form of the process manganese acetate and cobalt acetate in aqueous solution are fed to the oxidizer to catalyze the oxidation reactions.

The co-solvents include water, C<sub>1</sub> to C<sub>5</sub> alcohols, such as methanol or ethanol, C<sub>5</sub> to C<sub>10</sub> hydrocarbons, such as p-xylene, and C<sub>1</sub> to C<sub>10</sub> organic acids, such as formic acid or acetic acid, etc. It is thus possible to include about 1 to about 50% inert solvents having boiling points ranging from 25 to 200° C. as the co-solvents.

(see col. 3 ,lines 1-6)

The effluent from the oxidizer at about 160° C. is transferred and filtered via a first filter to separate the solid from mother liquor (filtrate). During filtering, the solid cake is washed with m-xylene which is heated from 30° C. to 100–150° C. The mother liquor is transferred to a first holding tank. The cake washing liquid is removed separately from the first filter to a second holding tank.

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The washed cake from the third filter is passed through a wash column or multistage contactor and counter-current water is added to remove the crystallization solvent. The slurry from the wash column or contactor is then fed to the soaker where the temperature is raised to from between about 150–250° C. to remove trapped solvent from the crystals. The slurry is finally filtered and dropped to a product dryer where water (moisture) in the cake is removed by heating and purging with a counter-current flow of heated nitrogen. The dried PTA product is removed from the dryer and is stored in the product bin.

(see col. 15 ,lines 29-40).

This is identical with the claims.

### ***Claim Rejections - 35 USC § 103***

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (U.S. 6,013,835).

Lee et al teaches a process of producing terephthalic acid in the followings (see col. 14, lines 11-35):

The present inventions will be described in terms of the production and recovery of terephthalic acid (TA) from the air oxidation of p-xylene in the presence of a solution of components of catalysis in dimethyl terephthalate (DMT) or in a benzoic acid-water solvent system. The oxidizer temperature is preferably between about from 150° C. and about 250° C. and the pressure is from between about 5 and about 30 kg per cm<sup>2</sup>. Since the oxidizer effluent will contain up to 30% TA, mixing in the oxidizer is very important in order to maintain the yield and selectivity, and to prevent fouling and blockages. The initial mixing of the feed streams may be achieved in a static mixer (outside of the oxidizer). Further mixing may be provided by air sparging and external circulation. In the preferred form of the process manganese acetate and cobalt acetate in aqueous solution are fed to the oxidizer to catalyze the oxidation reactions.

The co-solvents include water, C<sub>1</sub> to C<sub>5</sub> alcohols, such as methanol or ethanol, C<sub>5</sub> to C<sub>10</sub> hydrocarbons, such as p-xylene, and C<sub>1</sub> to C<sub>10</sub> organic acids, such as formic acid or acetic acid, etc. It is thus possible to include about 1 to about 50% inert solvents having boiling points ranging from 25 to 200° C. as the co-solvents.

(see col. 3 ,lines 1-6)

The effluent from the oxidizer at about 160° C. is transferred and filtered via a first filter to separate the solid from mother liquor (filtrate). During filtering, the solid cake is washed with m-xylene which is heated from 30° C. to 100–150° C. The mother liquor is transferred to a first holding tank. The cake washing liquid is removed separately from the first filter to a second holding tank.

The washed cake from the third filter is passed through a wash column or multistage contactor and counter-current water is added to remove the crystallization solvent. The slurry from the wash column or contactor is then fed to the soaker where the temperature is raised to from between about 150–250° C. to remove trapped solvent from the crystals. The slurry is finally filtered and dropped to a product dryer where water (moisture) in the cake is removed by heating and purging with a counter-current flow of heated nitrogen. The dried PTA product is removed from the dryer and is stored in the product bin.

(see col. 15 ,lines 29-40).

The instant invention, however, differs from Scott et al in that the drying zone evaporates at least 10 % of volatiles in the wet carboxylic acid cake.

With respect to the evaporation of at least 10 % of volatiles in the wet carboxylic acid cake in the drying zone, the prior art is silent. However, the prior art does undergo the drying process of the wet carboxylic acid cake in the drying zone without disclosing the amount of the volatiles during the evaporation. Moreover, the limitation with a process with respect to pH and ,time, and concentration does not impart patentability to a process when such values are those which would be determined by one of ordinary skill in the art in achieving optimum operation of the process. Concentration is well-understood by those of ordinary skill in the art to be a result-effective variable, especially when attempting to control selectivity of chemical process. Therefore, it would have been obvious to the skilled artisan in the art to be motivated to optimize the drying



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process by using the solid-liquid separation device. This is because the skilled artisan in the art would expect the reaction process to be facilitated by employing such devices.

Lee et al teaches does teach the process of producing terephthalic acid by oxidation of para xylene in the reactor in the presence of acetic acid solvent containing cobalt and bromine and further purifying the resultant slurry of the terephthalic acid by filtrations and/or counter current washing processes. Although the prior art does not specify the amount of the volatiles during the evaporation, the percentage of volatiles in the wet carboxylic acid cake can be considered by those of ordinary skill in the art to be a result-effective variable, especially when attempting to control selectivity of chemical process. Therefore, it would have been obvious to the skilled artisan in the art to be motivated to optimize the drying process of the wet carboxylic acid cake in the drying zone by a routine experimentation. This is because the skilled artisan in the art would expect such a modification process to be feasible and successful in order to evaporate the certain amount of the solvent present in the wet carboxylic acid cake

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Andres can be reached on 571-272-0867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Taylor Victor Oh/  
Primary Examiner, Art Unit 1625  
8/6/08